

**CLAIMS**

What is claimed is:

1. A transmission frame for transporting information in a plurality of interconnected communication networks having a plurality of communication nodes, comprising:

a message field containing message information; and

a plurality of addresses identifying a plurality of destination nodes in the plurality of

5 interconnected communication networks.

2. The transmission frame of claim 1, further comprising an originator's address identifying an originator of the message information.

3. The transmission frame of claim 1, further comprising a maximum hop indicator indicating a maximum number of transmissions of the message information to reach one of the destination nodes.

4. The transmission frame of claim 1, further comprising a precedence indicator indicating a level of priority for scheduling transmission of the message information across the interconnected networks.

5. The transmission frame of claim 1, further comprising a security indicator indicating a level of security for the message.

6. The transmission frame of claim 1, further comprising a message delivery status indicator associated with one of the plurality of addresses indicating if the message information was sent to said address.

7. The transmission frame of claim 1, wherein at least one of the plurality of addresses comprises a home network identifier and an identifier of a terminal device within the home network.

8. The transmission frame of claim 7, further comprising an extended network identifier for said at least one of the plurality of addresses, identifying a network other than said home network to which to send the message information to said terminal.

9. The transmission frame of claim 8, further comprising an extended address indicator indicating whether said at least one of the plurality of addresses has an extended network identifier.

10. The transmission frame of claim 1, further comprising a user-defined indicator for use by an application layer process.

11. The transmission frame of claim 1, further comprising an end of routing indicator identifying the last of the plurality of addresses in the transmission frame.

12. The transmission frame of claim 1, further comprising an acknowledgement indicator indicating a disposition of the message information.

13. The transmission frame of claim 12, wherein the acknowledgement indicator indicates that the message information is received by a user at one of the plurality of addresses.

14. The transmission frame of claim 12, wherein the acknowledgement indicator indicates that the message information is read at one of the plurality of addresses.

15. The transmission frame of claim 12, wherein the acknowledgement indicator indicates that the message information is printed at one of the plurality of addresses.

16. The transmission frame of claim 8, wherein the terminal device is a radio.

17. A method of routing a message addressed to a plurality of addressees among a plurality of interconnected communication networks having a plurality of communication nodes, wherein the message is included within a transmission frame having a header containing the plurality of addresses, and the transmission frame is located at one of the plurality of communication nodes, the method comprising:

determining if any of the plurality of addresses contained in the header corresponds to a device serviced by the communication node; and

determining a routing disposition for the plurality of addresses contained in the header that do not correspond to the device serviced by the communication node.

18. The method of claim 17, further comprising:

generating a new header containing addresses among the plurality of addresses determined not to correspond to the device serviced by the communication node and that have the same routing disposition; and

transmitting a new transmission frame containing the message and the new header, according to the determined routing disposition for the addresses contained in the new header.

19. The method of claim 17, wherein a delivery indicator is associated with each of the plurality of addresses, the method further comprising,

setting the delivery indicator of an address to which the message is delivered; and

transmitting the transmission frame according to the determined routing disposition for  
 5 the addresses with delivery indicators not set.

20. The method of claim 17, wherein the routing disposition is determined according to routing information available at the communication node.

21. The method of claim 17, wherein the routing disposition for the plurality of addresses is determined only for the plurality addresses to which the message has not been sent.

22. The method of claim 21, wherein the header contains information indicating to which of the plurality of addresses the message has been sent.

23. A communications node in a network interconnected with a plurality of communication networks, the communications node routing a message addressed to a plurality of addressees, the message being contained in a transmission frame that includes a header containing the plurality of addresses, the communications node comprising:

means for examining the plurality of addresses in the header;

means for sending the message to a terminal device within the network containing the communication node if one of the plurality of addresses in the header corresponds to the terminal device;

10 means for determining a routing disposition for the plurality of addresses in the header that do not correspond to the terminal device; and

means for sending the message to addresses having the same routing disposition.

24. The communication node of claim 23, wherein the means for sending the message to the terminal device is a radio transmitter.

25. The communication node of claim 23, wherein the means for determining a routing disposition is a network router with a routing table.

26. A communication node in a home network interconnected with a plurality of communication networks, for processing a transmission frame having a message and a header containing a plurality of destination addresses, the communication node comprising:

a home network routing table having recorded therein addresses of terminals in the home  
5 network;

an internetwork routing table having recorded therein routing information for routing  
messages destined for at least one of the plurality of networks; and

a router, coupled to the home network routing table and the internetwork routing table,  
the router identifying as a home address an address among the plurality of destination addresses  
10 in the header that is present in the home network routing table, and determining a routing  
disposition for addresses among the plurality of destination addresses that are not present in the  
home network routing table, wherein the routing disposition is determined based on the routing  
information recorded in the internetwork routing table.

27. The communication node of claim 26, wherein each of the plurality of destination  
addresses in the header has a delivery indicator indicating if the message has been send toward  
the corresponding destination address, the communication node further comprising a transmitter,  
coupled to the router, sending the message to a terminal in the home network having an address  
5 identified by the router as a home address, setting the delivery indicator for the address identified  
as a home network address, and in accordance with the routing disposition sending the message  
to addresses in the header that do not have delivery indicators set.

28. The communication node of claim 26, further comprising a transmitter, coupled to the router, sending the message to terminals in the home network having addresses identified by the router as home addresses, generating a new transmission frame including the message and the addresses having the same routing disposition determined by the router, and outputting the new transmission frame in accordance with the routing disposition.

29. The communication node of claim 28, wherein the communication node is included in a radio.

30. An originating terminal in a plurality of interconnected communication networks, the originating terminal comprising:

a message generation device generating a message for delivery to a plurality of destination terminals in the interconnected networks;

a network interface device coupled to the message generation device, and in response to receiving the message, generating a transmission frame having a message and a header containing addresses of the plurality of destination terminals; and

a transmitter coupled to the network interface device, transmitting the transmission frame to a communication node in one of the interconnected networks for routing to the destination terminals.

31. A method of generating a message addressed to a plurality of terminals among a plurality of interconnected communication networks, the method comprising:

generating a message for delivery to the terminals;

generating a header containing a plurality of addresses of the terminals; and

5 transmitting a transmission frame including the header and the message to a communication node among the plurality of communication networks for routing to the addressed terminals.

32. The method of claim 31, wherein generating the header includes generating one of the plurality of addresses having a basic address identifying a terminal within one of the plurality of interconnected networks, and an extended address identifying said one the plurality of interconnected networks containing said terminal.

33. A computer program, embodied on a computer-readable medium, comprising:  
program instructions for examining a header of a transmission frame, the header containing addresses of a plurality of destination terminals among a plurality of interconnected communication networks;

program instructions for determining if any of the addresses contained in the header corresponds to a terminal connected to a home network, wherein an address for the terminal connected to the home network is recorded in a home network routing table;

program instructions for determining a routing disposition for the addresses in the header that do not correspond to a terminal in the home network; and

10 program instructions for sending the transmission frame to addresses having the same routing disposition.

34. A method of receiving a message within a plurality of interconnected communications networks, the message being transmitted in a plurality of frames each frame

having a frame sequence number, an originator's address, and a plurality destination addresses,  
the method comprising:

- 5           storing a first frame;
- receiving a second frame;
- determining if an originator's address in the second frame matches an originator's  
address in the first frame; and
- ordering the first and second frame based on the frame sequence numbers in the first and  
10       second frames.

35.       The method of claim 34, wherein each frame of the message includes a delivery  
indicator associated with each of the destination addresses, the method further comprising setting  
the delivery indicator of one of the destination addresses if the frame is delivered to said  
destination address.

36.       The method of claim 34, further comprising determining if one or more frames of  
the message are not received at a destination address, and requesting retransmission of only those  
frames.

37.       The method of claim 36, wherein the determining if a frame of a message is not  
received and requesting retransmission of the frame is performed in a transport layer of a set of  
communication protocols.